





Case Report

A seed link connector protruding into the bladder formed a bladder stone

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Abbreviations & Acronyms

EBRT = external beam radiotherapy
HDR-B = high-dose-rate brachytherapy
LDR-B = low-dose-rate brachytherapy

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Introduction: Low-dose-rate brachytherapy is performed for localized prostate cancer. We report the first case of a bladder stone encompassing the seed migrated into the bladder in a patient treated with low-dose-rate brachytherapy.

Case presentation: A man was diagnosed with prostate cancer and underwent low-dose-rate brachytherapy. After 2 months, dysuria occurred, and ultrasonography revealed a needle-shaped high-intensity protruding from the prostate into the bladder. Cystoscopy examination found a seed link connector. With the possibility of natural dissolution of the seed link, careful observation was chosen. However, 16 months later, hematuria occurred, and an X-ray revealed a bladder stone encompassing the seed. Compared with the X-ray right after seeding, the seed located near the right bladder neck had fallen. The seed was removed by transurethral bladder lithotripsy.

Conclusion: Seeds should be carefully located within the prostate, otherwise a bladder stone may be formed encompassing the seed.

Key words: bladder stone, migration, seed.

Keynote message

This is the first image that confirms that the seed link connector has strayed into the bladder. We were even able to see the site of seed shedding initially, but later a bladder stone encompassing the seed was formed. The appearance of dysuria or hematuria after LDR-B should be closely examined with seed migration in mind.

Introduction

Prostate cancer is the most prevalent cancer in Japan and the second most prevalent in the world.¹ Radiotherapy, including EBRT, LDR-B, and HDR-B, is performed for localized prostate cancer according to the risk.² Radical prostatectomy frequently used surgical clips, and clips migrating into the bladder have been previously reported.^{3–6} Here, we report the first case of a bladder stone encompassing the seed migrated into the bladder in a patient treated with LDR-B.

Case presentation

A 71-year-old male patient was diagnosed with localized prostate cancer (cT1cN0M0, initial prostate-specific antigen: 9.41 ng/mL, Gleason Score: 3 + 3 = 6, and low risk of D'Amico classification) and underwent LDR-B with I-125 seed after 6 months of combined androgen blockade. Dysuria occurred after 2 months. Ultrasonography revealed a needle-shaped high-intensity protrusion from the prostate into the bladder, and cystoscopy examination detected a seed link connector (Fig. 1a,b). With the possibility of natural dissolution of the seed link, careful observation without any surgical treatment was performed. However, 16 months later, hematuria occurred, and an X-ray revealed a bladder stone encompassing the seed (Fig. 2a,b).

Fig. 1 (a) Ultrasonography revealed a needle-shaped high-intensity substance from the prostate into the bladder. (b) Cystoscopy revealed a similar substance in the neck of the bladder.

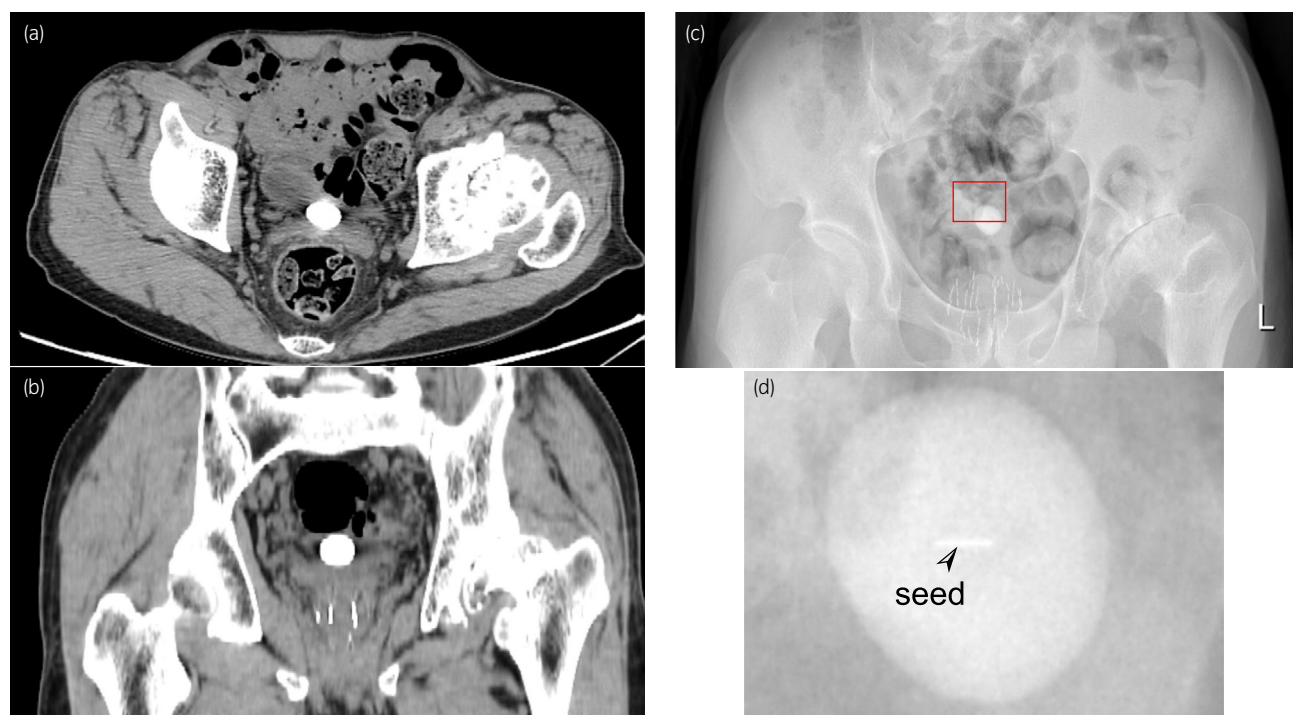
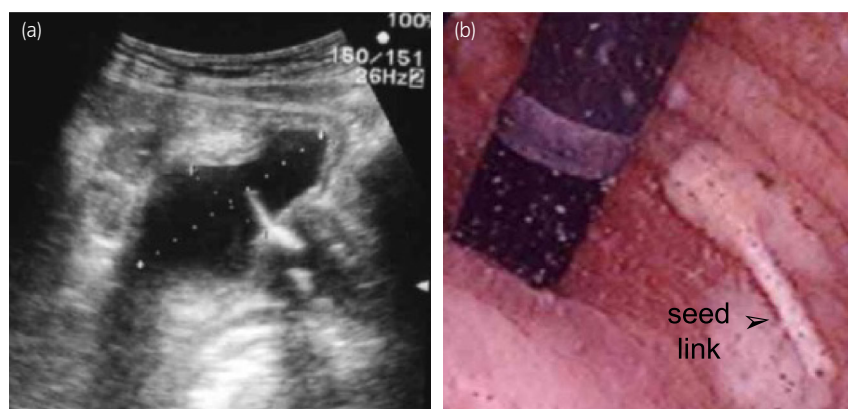


Fig. 2 (a) CT at the appearance of hematuria (axial). (b) X-ray, bladder stone encompassing the SEED. (c) X-ray after seeding. (d) Compared with the X-ray right after seeding the seed located near the right bladder neck had fallen.

Compared with the X-ray right after seeding, it revealed the seed located near the right bladder neck had fallen (Fig. 2c, d). The seed was removed by transurethral bladder lithotripsy (Fig. 3a–d). The stone consists of calcium oxalate. Hematuria and dysuria have improved, with no prostate cancer recurrence or further seed migration into the bladder postoperatively.

Discussion

Seed shedding into the bladder and bladder stones nucleating them have been previously reported.^{7,8} Furthermore, seed shedding has been reported to cause urethral stones.⁹ These cases are thought to have gradually migrated into the bladder from the prostatic tissue over time and exposed in the bladder

or urethra, and finally formed bladder or urethral stones several years later. In our case, the seed remained connected initially as a connected seed was used in our hospital, but later it migrated into the bladder after the connector melted, and finally formed a stone encompassing the seed (Fig. 4). Our case is the first report of a bladder stone formation caused by this peculiar mechanism.

LDR-B has diverse complications, including frequent urination, intermittency, urgent incontinence, and hematuria.^{10–13} We have also experienced ischemic enterocolitis after LDR-B, and defecation as well as urination control is important.¹⁴ Dysuria and hematuria in LDR-B are reported in 7%–13% and 0%–14% of cases, respectively.¹³ Furthermore, within the first postoperative years, dysuria often occurs within 1–2 months, and hematuria is relatively rare, occurring

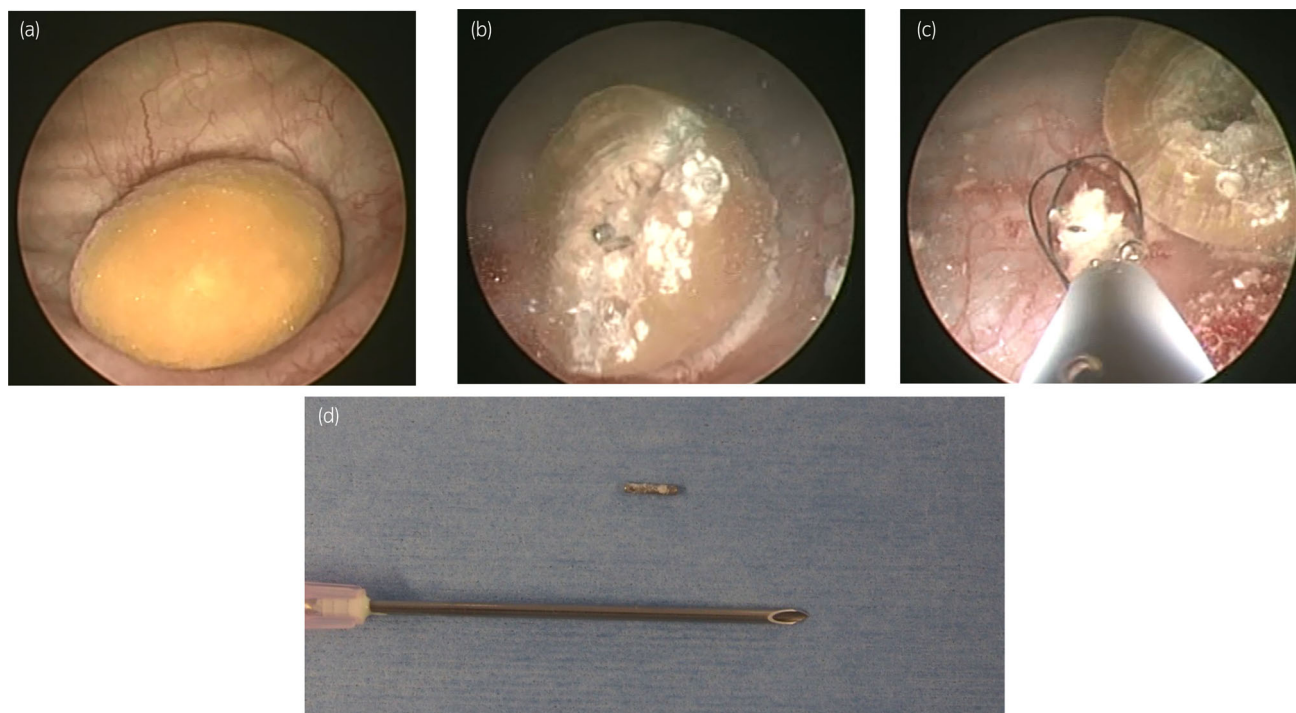


Fig. 3 (a) Bladder stone observed during surgery. (b) The seed is identified within the stone. (c) The seed was removed by transurethral bladder lithotripsy. (d) The removed seed was comparable to the size of the 18-G needle.

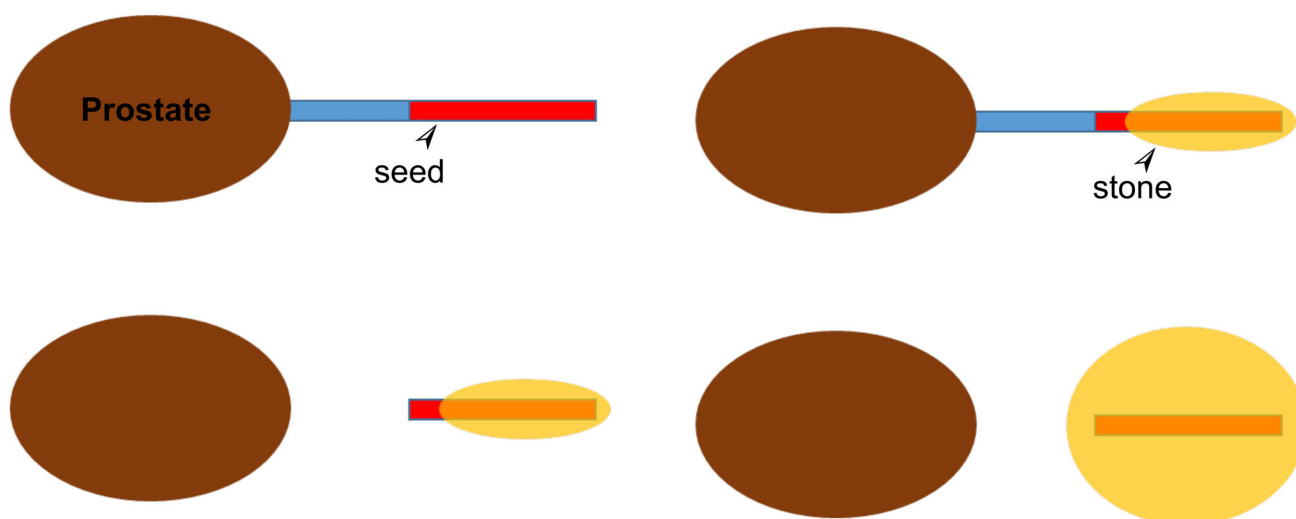


Fig. 4 Stone formed to encompass the seed of the link seed inserted into the prostate, and the connector broke and fell into the bladder over time, causing the stone to grow larger.

in 0.2% of cases.¹⁰ In our case, symptoms appeared after 2 months, thus the disease was detected same time as the report.^{7–9}

Seeds dropout into the urethra has been reported in 29.7% of patients and 0.58% of the total sources, and the time of dropout is mostly within 7 days after LDR-B. Technical problems induce dropout and seed migration.^{10,11,13} Seed migration into the body is relatively common, occurring in 25%–55% of patients.^{13,15} Migration has been reported in the thorax, abdomen, and pelvic region, with the thorax being the

most common site, reportedly in 18%–55% of patients.^{16,17} Seed migration into the body is often asymptomatic, thus it is less frequently reported, and clinical dosimetry effects have not been reported.^{16,18,19}

Conclusion

We report a case with seed migration into the bladder after LDR-B for prostate cancer. Seeds should be carefully located within the prostate, otherwise seeds may migrate into the

bladder and form a bladder stone encompassing the seed. A close examination should be performed if symptoms, such as dysuria and hematuria appeared.

Approval of the research protocol by an Institutional Review Board

Not applicable.

Data accessibility

Not applicable.

Author contributions

Shuhei Aoyama: Data curation; investigation; project administration; resources; visualization; writing – original draft; writing – review and editing. Kouji Izumi: Conceptualization; project administration; resources; writing – review and editing. Suguru Kadomoto: Writing – review and editing. Tomoyuki Makino: Writing – review and editing. Renato Naito: Writing – review and editing. Hiroaki Iwamoto: Writing – review and editing. Hiroshi Yaegashi: Writing – review and editing. Shohei Kawaguchi: Writing – review and editing. Kazuyoshi Shigehara: Writing – review and editing. Takahiro Nohara: Writing – review and editing. Atsushi Mizokami: Supervision; writing – review and editing.

Conflict of interest

The authors declare no conflict of interest.

Informed consent

Not applicable.

Registry and the Registration No. of the study/trial

Not applicable.

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